

UNICORN | **Systems**

entsoe

ENTSO-E

Energy Communication Platform

Upgrade Guide v4.4.0



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1. Executive Summary

This document provides upgrade instructions for all ECP components.

2. Revision History

Version	Date	Description
4.1.3	20.11.2017	Initial version
4.1.4	05.02.2018	Documentation review
4.2.0	21.03.2018	Version update
4.3.0	25.06.2018	Version update
4.3.0	24.09.2018	CD/endpoint uninstallation via admin console
4.3.0	12.11.2018	Data directories paths update
4.4.0	13.06.2019	Updated for the ECP 4.4.0 version

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4. ECP Endpoint Upgrade

4.1 Upgrade on Windows

4.1.1 Variables used in the guide

Variables used throughout this upgrade guide are using the <variable_name> format. These variables are used only within this guide and are not to be confused with variables of your OS.

Name	Description
<install_path>	Path pointing to the installation directory

4.1.2 Stop application

Stop the application according to steps described in the chapter 3.1.8.

4.1.3 Backup data and configuration

Back up the following files and folders:

- <install_path>\authKeystore.jks
- <install_path>\ecp.properties
- <install_path>\ecp-users.properties (added in ECP 4.4.0)
- <install_path>\jmxremote.properties (added in ECP 4.3.2)
- <install_path>\keystore.jks
- <install_path>\content
- <install_path>\db
 - if embedded database is used
- <install_path>\internalBroker
 - if embedded database is used

4.1.4 Uninstall older version of application

Navigate to <install_path>\Uninstaller and run *uninstaller.jar*. After that the whole application folder is deleted.

In case of uninstalling via CMD:

- Run the command line as an administrator.
- Navigate to <install_path>\Uninstaller and execute the following command:
 - `java -jar uninstaller.jar -c`

Uninstaller will remove all application components and deregister the service, if present.

4.1.5 Install new version of application

For installation of the new version follow the steps of the Installation Guide. Skip the Prerequisites and Database installations steps.

The database scheme update is done automatically after the start of the application.

4.1.6 Restore data and configuration

Restore the backed up files and folders to:

- <install_path>\authKeystore.jks
- <install_path>\ecp.properties
- <install_path>\ecp-users.properties (if it was already part of back up)

- <install_path>\jmxremote.properties (if it was already part of back up)
- <install_path>\keystore.jks
- <install_path>\content
- <install_path>\db
 - if embedded database is used
- <install_path>\internalBroker
 - if embedded database is used

4.1.7 Update configuration

Apply changes from the following chapters when upgrading from ECP 4.3.0., ECP 4.3.1 or ECP 4.3.2

4.1.7.1 User authentication

If you want to keep ECP Endpoint GUI and WS integration channel with anonymous access, you must add in the *ecp.properties* to the *spring.profiles.active* property the following profiles: *disable-user-auth,disable-ws-auth* (comma separated values). For more details see ECP Administration guide, chapter 5.1 User Authentication.

If you want to keep the user authentication, configure the users and their password in the *ecp-users.properties*, Eventually you can encrypt the passwords as described in the ECP Administration guide, chapter 4.6 Encrypted passwords.

4.1.7.2 External databases

If **MySQL** database is used, the **MySQL** database connection parameter (*ecp.db.url*) value must be changed to match the following pattern:

```
> jdbc:mariadb://<host>:<port>/<schema>?autoReconnect=true
```

New system configuration property "spring.datasource.driver-class-name" added for all external databases. See the Installation Guide for more details (11. External Databases and then specific sub-chapter according to your used DB).

4.1.7.3 Secured monitoring interfaces

Use the following configuration changes to secure monitoring interfaces (JMX, Hawtio, Jolokia):

- > Remote JMX interface is disabled as the default installation setting. For instruction on enabling remote JMX, refer to the ECP Administration Guide chapter 5.23
- > It is recommended to enable Hawtio console authentication after the upgrade (Hawtio authentication is disabled by default). For instruction on enabling Hawtio authentication, refer to the ECP Administration Guide chapter 5.21
- > It is recommended to restrict Hawtio Jolokia access for specific IP. For instructions on securing Jolokia, refer to the ECP Administration Guide chapter 5.22.

4.1.7.4 Audit log

New system configuration property *logging.path* added for Audit Log. Please see chapter How to enable separate Audit Log file in the ECP Administration Guide for detail.

4.1.8 Starting and stopping ECP endpoint

4.1.8.1 Using GUI

a) If installed as a service:

- > Start > Run > "services.msc"
- > Find service with name like " ecp-endpoint " and description "ECP endpoint"
- > Start / stop service by buttons on the top left

b) If not installed as a service:

- > Start / stop application by using
 - <install_path>\tomcat\bin\startup.bat
 - <install_path>\tomcat\bin\shutdown.bat

4.1.8.2 Using the command line

- a) If installed as a service:
- > Start service using
 - SC start ecp-endpoint
 - > Stop service using
 - SC stop ecp-endpoint
- b) If not installed as a service:
- > Start application using
 - <install_path>\tomcat\bin\startup.bat
 - > Stop application using
 - <install_path>\tomcat\bin\shutdown.bat

4.2 Upgrade on Linux

4.2.1 Variables

Variables used throughout this upgrade guide are using the <variable_name> format. These variables are used only within this guide and are not to be confused with variables of your OS.

Name	Description
<install_path>	Path pointing to the installation directory

4.2.2 Stop application

Stop the application according to steps described in the chapter 3.2.8.

4.2.3 Back up data and configuration

Back up the following configuration files and folders:

- /etc/default/ecp-endpoint
- /etc/ecp-endpoint
- /var/lib/ecp-endpoint*

* This corresponds to the value of dataDirectory in ecp.properties. If the data directory is set differently, the backup path would be the one set in the ecp.properties file.

4.2.4 Uninstall older version of application

Change the directory to the folder where the ECP rpm installer is located and the invoke rpm erase.

```
rpm -e ecp-endpoint
```

4.2.5 Install new version of application

For installation of the new version follow the steps of the Installation Guide. Prerequisites and database installations steps are skipped. Following are the new prerequisites compare to ECP 4.3.0 version:

- > ca-certificates -The Mozilla CA root certificate bundle is expected to be installed on OS
 - use yum install ca-certificates to install certificate bundle
- > tzdata-java - This package contains timezone information for use by Java runtimes.
 - Use yum install tzdata-java to install time zone information

The database scheme update is done automatically after the start of the application.

With ECP 4.4.0, rpm install keeps original configuration files and create the new with suffix .rpmnew. If you want to keep your existing configuration, follow to the next chapter 4.2.7 Upgrade configuration.

4.2.6 Restore configuration

If the backed up files and folders are missing after installation, restore the backed up files and folders to:

- /etc/default/ecp-endpoint
- /etc/ecp-endpoint
- /var/lib/ecp-endpoint*

* This corresponds to the value of dataDirectory in ecp.properties. If the data directory is set differently, the restore path would be the one set in the ecp.properties file.

4.2.7 Upgrade configuration

Apply changes from the following chapters when upgrading from ECP 4.3.0.

4.2.7.1 User authentication

If you want to keep ECP Endpoint GUI and WS integration channel with anonymous access, you must add in the *ecp.properties* to the *spring.profiles.active* property the following profiles: *disable-user-auth,disable-ws-auth* (comma separated values). For more details see ECP Administration guide, chapter 5.1 User Authentication.

If you want to keep the user authentication, configure the users and their password in the *ecp-users.properties*. Eventually you can encrypt the passwords as described in the ECP Administration guide, chapter 4.6 Encrypted passwords.

4.2.7.2 External databases

If **MySQL** database is used, the **MySQL** database connection parameter (*ecp.db.url*) value must be changed to match the following pattern:

> jdbc:mariadb://<host>:<port>/<schema>?autoReconnect=true

New system configuration property "spring.datasource.driver-class-name" added for all external databases. See the Installation Guide for more details (11. External Databases and then specific sub-chapter according to your used DB).

4.2.7.3 Secured monitoring interfaces

Use the following configuration changes to secure monitoring interfaces (JMX, Hawtio, Jolokia):

- > Remote JMX interface is disabled as the default installation setting. For instruction on enabling remote JMX, refer to the ECP Administration Guide chapter 5.23
- > It is recommended to enable Hawtio console authentication after the upgrade (Hawtio authentication is disabled by default). For instruction on enabling Hawtio authentication, refer to the ECP Administration Guide chapter 5.21
- > It is recommended to restrict Hawtio Jolokia access for specific IP. For instructions on securing Jolokia, refer to the ECP Administration Guide chapter 5.22.

4.2.7.4 Audit log

New system configuration property *logging.path* added for Audit Log. Please see chapter How to enable separate Audit Log file in the ECP Administration Guide for detail.

4.2.8 Starting and stopping ECP endpoint

After ECP endpoint is configured, it can be started. ECP endpoint is registered as a Linux service. The following commands are available:

- > To start ECP, use command "*service ecp-endpoint start*"
- > To stop ECP, use command "*service ecp-endpoint stop*"
- > To display the ECP logs, use command "*service ecp-endpoint log*"

If not installed as a service:

- > Start application using bash script "*<install_path>/tomcat/bin/startup.sh*"
- > Stop application using bash script "*<install_path>/tomcat/bin/shutdown.sh*"

5. ECP Component Directory Upgrade

5.1 Upgrade on Windows

5.1.1 Variables used in the guide

Variables used throughout this upgrade guide are using the <variable_name> format. These variables are used only within this guide and are not to be confused with variables of your OS.

Name	Description
<install_path>	Path pointing to the installation directory

5.1.2 Stop application

Stop the application according to steps described in the chapter 4.1.8.

5.1.3 Backup data and configuration

Back up the following files and folders:

- <install_path>\authKeystore.jks
- <install_path>\ecp-directory.properties
- <install_path>\ecp-users.properties (added in ECP 4.4.0)
- <install_path>\jmxremote.properties (added in ECP 4.3.2)
- <install_path>\keystore.jks
- <install_path>\db
 - if embedded database is used

5.1.4 Uninstall older version of application

Navigate to <install_path>\Uninstaller and run uninstaller.jar. After that the whole application folder is deleted.

In case of uninstalling via CMD: Stop the application and run the command line as an administrator. Navigate to <installation directory>\Uninstaller and execute the following command:

```
> java -jar uninstaller.jar -c
```

Uninstaller will remove all application components and deregister the service if present.

5.1.5 Install new version of application

For installation of the new version follow the steps of the Installation Guide. Prerequisites and database installations steps are skipped.

The database scheme update is done automatically after the start of the application.

5.1.6 Restore data and configuration

Restore the backed up files and folders to:

- <install_path>\authKeystore.jks
- <install_path>\ecp-directory.properties
- <install_path>\ecp-users.properties (if it was already part of back up)
- <install_path>\jmxremote.properties (if it was already part of back up)
- <install_path>\keystore.jks
- <install_path>\db
 - if embedded database is used

5.1.7 Update configuration

Apply changes from the following chapters when upgrading from ECP 4.3.0.

5.1.7.1 External databases

If **MySQL** database is used, the **MySQL** database connection parameter (`ecp.db.url`) value must be changed to match the following pattern:

```
> jdbc:mariadb://<host>:<port>/<schema>?autoReconnect=true
```

New system configuration property "spring.datasource.driver-class-name" added for all external databases. See the Installation Guide for more details (11. External Databases and then specific sub-chapter according to your used DB).

5.1.7.2 User authentication

Username and passwords are written in the new format and in the separate file. Refer chapter 6.1 User Authentication in ECP Administration Guide for details.

You can newly encrypt the passwords in the `ecp-users.properties`, as described in the ECP Administration guide, chapter 4.6 Encrypted passwords.

5.1.7.3 Secured monitoring interfaces

Remote JMX interface is disabled as the default installation setting. For instruction on enabling remote JMX, refer to the ECP Administration Guide chapter 6.4

5.1.7.4 Audit log

New system configuration property `logging.path` added for Audit Log. Please see chapter How to enable separate Audit Log file in the ECP Administration Guide for detail.

5.1.8 Starting and stopping ECP Component Directory

5.1.8.1 Using GUI

a) If installed as a service:

- > Start > Run > "services.msc"
- > Find service with name like "ecp-directory" and description "ECP Directory"
- > Start / stop service by buttons on the top left

b) If not installed as a service:

- > Start / stop application by using
 - `<install_path>\tomcat\bin\startup.bat`
 - `<install_path>\tomcat\bin\shutdown.bat`

5.1.8.2 Using the command line

a) If installed as a service:

- > Start service using
 - `SC start ecp-directory`
- > Stop service using
 - `SC stop ecp-directory`

b) If not installed as a service:

- > Start application using
 - `<install_path>\tomcat\bin\startup.bat`
- > Stop application using
 - `<install_path>\tomcat\bin\shutdown.bat`

5.2 Upgrade on Linux

5.2.1 Variables

Variables used throughout this upgrade guide are using the <variable_name> format. These variables are used only within this guide and are not to be confused with variables of your OS.

Name	Description
<install_path>	Path pointing to the installation directory

5.2.2 Stop application

Stop the application according to steps described in the chapter 4.2.8.

5.2.3 Back up data and configuration

Back up the following configuration files and folders:

- /etc/default/ecp-directory
- /etc/ecp-directory
- /var/lib/ecp-directory*

* This corresponds to the value of dataDirectory in ecp-directory.properties. If the data directory is set differently, the backup path would be the one set in the ecp-directory.properties file.

5.2.4 Uninstall older version of application

Change the directory to the folder where the ECP rpm installer is located and the invoke rpm erase.

```
rpm -e ecp-directory
```

5.2.5 Install new version of application

For installation of the new version follow the steps of the Installation Guide. Prerequisites and database installations steps are skipped. Following are the new prerequisites compare to ECP 4.3.0 version:

- > ca-certificates -The Mozilla CA root certificate bundle is expected to be installed on OS
 - use yum install ca-certificates to install certificate bundle
- > tzdata-java - This package contains timezone information for use by Java runtimes.
 - Use yum install tzdata-java to install time zone information

The database scheme update is done automatically after the start of the application.

With ECP 4.4.0, rpm install keeps original configuration files and create the new with suffix .rpmnew. If you want to keep your existing configuration, follow to the next chapter 5.2.7 Upgrade configuration.

5.2.6 Restore configuration

If the backed up files and folders are missing after installation restore the backed up files and folders to:

- /etc/default/ecp-directory
- /etc/ecp-directory
- /var/lib/ecp-directory*

* This corresponds to the value of dataDirectory in ecp-directory.properties. If the data directory is set differently, the restore path would be the one set in the ecp-directory.properties file.

5.2.7 Upgrade configuration

Apply changes from the following chapters when upgrading from ECP 4.3.0.

5.2.7.1 External databases

If **MySQL** database is used, the **MySQL** database connection parameter (`ecp.db.url`) value must be changed to match the following pattern:

```
> jdbc:mariadb://<host>:<port>/<schema>?autoReconnect=true
```

New system configuration property “`spring.datasource.driver-class-name`” added for all external databases. See the Installation Guide for more details (11. External Databases and then specific sub-chapter according to your used DB).

5.2.7.2 User authentication

Username and passwords are written in the new format and in the separate file. Refer chapter 6.1 User Authentication in ECP Administration Guide for details.

You can newly encrypt the passwords in the `ecp-users.properties`, as described in the ECP Administration guide, chapter 4.6 Encrypted passwords.

5.2.7.3 Secured monitoring interfaces

Remote JMX interface is disabled as the default installation setting. For instruction on enabling remote JMX, refer to the ECP Administration Guide chapter 6.4

5.2.7.4 Audit log

New system configuration property `logging.path` added for Audit Log. Please see chapter How to enable separate Audit Log file in the ECP Administration Guide for detail.

5.2.8 Starting and stopping ECP Component Directory

After ECP Component Directory is configured, it can be started. ECP Component Directory is registered as a Linux service. The following commands are available:

- > To start ECP, use command “`service ecp-directory start`”
- > To stop ECP, use command “`service ecp-directory stop`”
- > To display the ECP logs, use command “`service ecp-directory log`”

If not installed as a service:

- > Start application using bash script “`<install_path>/tomcat/bin/startup.sh`”
- > Stop application using bash script “`<install_path>/tomcat/bin/shutdown.sh`”

6. ECP Broker Upgrade

6.1 Upgrade on Windows

6.1.1 Variables used in the guide

Variables used throughout this upgrade guide are using the <variable_name> format. These variables are used only within this guide and are not to be confused with variables of your OS.

Name	Description
<install_path>	Path pointing to the installation directory

6.1.2 Stop application

Stop the application according to steps described in the chapter 5.1.5.

6.1.3 Upgrade ActiveMQ

Current version of ECP Broker uses ActiveMQ 5.15.8. You can find out your version of ActiveMQ for example in the web console of the broker. If it is not in version 5.15.8, ActiveMQ must be updated.

Backup <install_path>\activemq\data folder. If you made custom changes in configuration of ActiveMQ, backup changed files in <install_path>\activemq\conf.

Delete <install_path>\activemq folder.

Download and unpack ActiveMQ 5.15.8 binary distribution to <install_path> directory (e.g. C:\ecp-broker) and rename extracted folder "apache-activemq-5.15.8" to "activemq".

6.1.4 Upgrade application

Unzip the content of the installation package and move the content of the folder activemq\lib to <install_path>\activemq\lib.

Move broker-registration-tool.jar to the <install_path>.

Delete obsolete MySQL connector at path <install_path>\activemq\lib\mysql-connector-java-5.1.38.jar

Delete obsolete plugin-security-XXXX.jar at path <install_path>\activemq\lib\plugin-security-XXXX.jar where XXXX is version of previously installed ECP Broker.

6.1.4.1 Delete old libraries

ECP Broker installation package contains following libraries:

- plugin-security
- mariadb-java-client
- jackson-datatype-jsr310
- jackson-databind
- jackson-core
- jackson-annotations
- commons-lang
- commons-io
- bcprov-jdk15on

- bcpkix-jdk15on
- aopalliance

Delete any old version of these libraries from <install_path>\activemq\lib.

6.1.5 Upgrade configuration

If there are changes in the broker.properties file, the configuration have to be pushed into ECP Component Directory by the following command:

```
java -D"spring.config.location=<install_path>/broker.properties" -jar broker-registration-tool.jar -m PUSH_CONFIGURATION
```

Or using socks proxy configuration:

```
java -D"spring.config.location=<install_path>/broker.properties" -D"socksProxyHost=<ProxyIP>" -D"socksProxyPort=<ProxyPort>" -jar broker-registration-tool.jar -m PUSH_CONFIGURATION
```

Apply changes from the following chapters when upgrading from ECP 4.3.0.

6.1.5.1 Broker runtime configuration

Edit file <install_path>\activemq\conf\ecp-config.xml:

- > Add the bold line into the bean definition

```
<bean class="org.springframework.beans.factory.config.PropertyPlaceholderConfigurer">
  <property name="location" value="file:/opt/ecp-broker/broker.properties"/>
  <property name="ignoreUnresolvablePlaceholders" value="true"/>
  <property name="order" value="1" />
</bean>
```

- > Add the bold line into the bean definition

```
<!-- Component directory synchronization job -->
<bean id="directorySyncJob" class="eu.entsoe.ecp.directory.synchronization.BrokerDirectoryClientSyncJob">
  <property name="componentDirectory" ref="componentDirectoryBean"/>
  <property name="wsClient" ref="directoryComponentsWsClient" />
  <property name="directoryClientSynchronizationConfiguration" ref="directoryClientSyncConfiguration" />
  <property name="directorySynchronizationService" ref="directorySynchronizationService" />
  <property name="componentDirectoryStorage" ref="fileBasedComponentDirectoryStorage" />
  <property name="componentDirectoryCache" ref="componentDirectoryCache" />
  <property name="brokerCode" value="{ecp.broker.code}"/>
</bean>
```

6.1.5.2 Changes related to MySQL driver change

Please note that this change should be applied only if the broker is configured for an external MySQL database.

Edit file <install_path>\activemq\conf\activemq.xml:

Modify existing persistence adapter definition:

```
<jdbcPersistenceAdapter dataSource="#broker-ds" lockKeepAlivePeriod="5000">
```

to

```
<jdbcPersistenceAdapter adapter="#mysql-adapter" dataSource="#broker-ds" lockKeepAlivePeriod="5000">
```

Add new MySQL adapter definition:

```
<bean id="mysql-adapter" class="org.apache.activemq.store.jdbc.adapter.MySqlJDBCAdapter"/>
```

Modify existing property definition:

```
<property name="driverClassName" value="com.mysql.jdbc.Driver"/>
```

to

```
<property name="driverClassName" value="org.mariadb.jdbc.Driver"/>
```

Edit broker.properties file, value of the parameter *broker.store.jdbc.url*

- replace mysql with mariadb.

6.1.6 Starting and stopping ECP broker

Before starting the broker make sure that you have successfully performed the whole registration procedure described in ECP Installation Guide, chapter ECP Broker Registration **Chyba! Nebyl zadán název záložky..**

> Command line

- `<install_path>\activemq\bin\win64\activemq.bat start -D"ecp.directory.client.root=<install_path>"`

> To start the broker as a service:

- Edit file `<install_path>\activemq\bin\win64\wrapper.conf` - add additional Java parameter defined by the following line

```
wrapper.java.additional.13=-Decp.directory.client.root="<install_path>"
```

- Execute `<install_path>\activemq\bin\win64\InstallService.bat`

6.2 Upgrade on Linux

6.2.1 Variables used in the guide

Variables used throughout this upgrade guide are using the `<variable_name>` format. These variables are used only within this guide and are not to be confused with variables of your OS.

Name	Description
<code><install_path></code>	Path pointing to the installation directory

6.2.2 Stop application

Stop the application according to steps described in the chapter 5.2.5.

6.2.3 Upgrade ActiveMQ

Current version of ECP Broker uses ActiveMQ 5.15.8. You can find out your version of ActiveMQ for example in the web console of the broker. If it is not in version 5.15.8, ActiveMQ must be updated.

Backup `<install_path>/activemq/data` folder. If you made custom changes in configuration of ActiveMQ, backup changed files in `<install_path>/activemq/conf`.

Delete `<install_path>/activemq` folder.

Extract the downloaded ActiveMQ 5.15.8 package (`apache-activemq-5.15.8-bin.tar.gz`) to the `<install_path>` (e.g. `/opt/ecp-broker`) and rename the extracted folder to "activemq".

Restore backup of data folder in `<install_path>/activemq/data`.

6.2.4 Upgrade application

Unzip the content of the installation package and move the content of the folder `activemq/lib` to `<install_path>/activemq/lib`.

Move broker-registration-tool.jar to the <install_path>.

Delete obsolete MySQL connector at path <install_path>/activemq/lib/mysql-connector-java-5.1.38.jar

Delete obsolete plugin-security-XXXX.jar at path <install_path>/activemq/lib/plugin-security-XXXX.jar where XXXX is version of previously installed ECP Broker.

6.2.4.1 Delete old libraries

ECP Broker installation package contains following libraries:

- plugin-security
- mariadb-java-client
- jackson-datatype-jsr310
- jackson-databind
- jackson-core
- jackson-annotations
- commons-lang
- commons-io
- bcprov-jdk15on
- bcpkix-jdk15on
- aopalliance

Delete any old version of these libraries from <install_path>/activemq/lib.

6.2.5 Upgrade configuration

If there are changes in the broker.properties file, the configuration have to be pushed into ECP Component Directory by the following command:

```
java -D"spring.config.location=<install_path>/broker.properties" -jar broker-registration-tool.jar -m PUSH_CONFIGURATION
```

Or using socks proxy configuration:

```
java -D"spring.config.location=<install_path>/broker.properties" -D"socksProxyHost=<ProxyIP>" -D"socksProxyPort=<ProxyPort>" -jar broker-registration-tool.jar -m PUSH_CONFIGURATION
```

Apply changes from the following chapters when upgrading from ECP 4.3.0.

6.2.5.1 Broker runtime configuration

Edit file <install_path>\activemq\conf\ecp-config.xml:

- > Add the bold line into the bean definition

```
<bean class="org.springframework.beans.factory.config.PropertyPlaceholderConfigurer">  
  <property name="location" value="file:/opt/ecp-broker/broker.properties"/>  
  <property name="ignoreUnresolvablePlaceholders" value="true"/>  
  <property name="order" value="1" />  
</bean>
```

- > Add the bold line into the bean definition

```
<!-- Component directory synchronization job -->  
  <bean id="directorySyncJob" class="eu.entsoe.ecp.directory.synchronization.BrokerDirectoryClientSyncJob">  
    <property name="componentDirectory" ref="componentDirectoryBean"/>  
    <property name="wsClient" ref="directoryComponentsWsClient" />
```

```
<property name="directoryClientSynchronizationConfiguration" ref="directoryClientSyncConfiguration" />
<property name="directorySynchronizationService" ref="directorySynchronizationService" />
<property name="componentDirectoryStorage" ref="fileBasedComponentDirectoryStorage" />
<property name="componentDirectoryCache" ref="componentDirectoryCache" />
<property name="brokerCode" value="{ecp.broker.code}" />
</bean>
```

6.2.5.2 Changes related to MySQL driver change

Please note that this change should be applied only if the broker is configured for an external MySQL database.

Edit file `<install_path>\activemq\conf\activemq.xml`:

Modify existing persistence adapter definition:

```
<jdbcPersistenceAdapter dataSource="#broker-ds" lockKeepAlivePeriod="5000">
```

to

```
<jdbcPersistenceAdapter adapter="#mysql-adapter" dataSource="#broker-ds" lockKeepAlivePeriod="5000">
```

Add new MySQL adapter definition:

```
<bean id="mysql-adapter" class="org.apache.activemq.store.jdbc.adapter.MySqlJDBCAdapter"/>
```

Modify existing property definition:

```
<property name="driverClassName" value="com.mysql.jdbc.Driver"/>
```

to

```
<property name="driverClassName" value="org.mariadb.jdbc.Driver"/>
```

Edit `broker.properties` file, value of the parameter `broker.store.jdbc.url`

- replace `mysql` with `mariadb`.

6.2.6 Starting and stopping ECP broker

After the ECP broker is configured and registered, it can be started. The following commands are available:

- > Start the broker: "`<install_path>/activemq/bin/activemq start`"
- > Stop the broker: "`<install_path>/activemq/bin/activemq stop`"

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